THREE NEW RECORDS FOR DIATOMS FROM THE GREAT BASIN, USA

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ABSTRACT.—Three diatom species recently collected from Great Basin localities represent new records of these taxa from this region of western North America. *Cocconeis scutellum* Ehr. and *Melosira dubia* Kuetz. were collected from a thermal spring in Tooele County, Utah. *Nitzschia hustedtiana* Salah was collected from newly flooded marshes at the south end of the Great Salt Lake, Tooele County, Utah.

We have recently studied the algal floras from several regions of western North America. In particular, during the past few years we have examined the algae from the Great Salt Lake (Felix and Rushforth 1977, 1979, 1980, Rushforth and Felix 1982) and several thermal systems in the Great Basin Desert (Kaczmarska and Rushforth 1983a, 1983b, St. Clair and Rushforth 1977). These systems have proven to contain taxa that are unusual in comparison to other habitats in the area. For instance, Blue Lake Warm Spring contains 41 taxa that were new records for the state of Utah, 17 of which were also new records for North America (Kaczmarska and Rushforth 1984).

As a part of ongoing ecological studies, we have examined the diatoms from a previously unstudied thermal system in Tooele County, Utah. We have also studied newly inundated marshlands created by the flooding of lands at the south end of the Great Salt Lake due to unusually high water during the past few years. While studying these samples, we encountered three taxa unusual in this region that represent or confirm new records for Utah. This paper is a report and discussion of these taxa.

METHODS

Several periphyton samples were collected during 1983 and 1984 from a small thermal spring in Tooele County, Utah (T1S, R7W, Sec. 25), near the Genstar Dolomite Plant. These samples were collected by placing small amounts of attached algae and debris into vials. Similar samples were collected during July 1984 from ephemeral marshy pools at the south end of the Great Salt Lake, Tooele County, Utah (T2S, R4W, Sec. 4). All samples were returned to our laboratory and examined immediately. Samples were then cleared following standard procedures using boiling nitric acid. Strewn mounts were prepared using Naphrax high resolution mountant, and resulting slides were examined using Zeiss RA microscopes equipped with bright field and Nomarski optics.

RESULTS AND DISCUSSION

The diatom floras of the two study sites were interesting in their floristic composition. At the Genstar locality, two of the dominant taxa were *Melosira dubia* Kuetz. and *Cocconeis scutellum* Ehr. *M. dubia* represents a new record for Utah, whereas *C. scutellum* confirms a single questioned report by Patrick (1936). Both of these taxa are typically coastal in distribution. The third taxon reported in the present paper, *Nitzschia hustedtiana* Salah, was collected from the Great Salt Lake locality. This diatom is similar to specimens previously reported as *Nitzschia punctata* (Wm. Smith) Grun. from Utah Lake, and *N.* species (Patrick 1936) from the Great Salt Lake. These three taxa are described and discussed below.

***Cocconeis scutellum* Ehrenberg** 1838. Figs. 1–5, 8–9. Valve elliptical, 16–21 μm wide by 20–27 μm long; rapheless valve striae radiate, 8–10 in 10 μm, proliferating to 2–3 rows of small punctae near valve margin;

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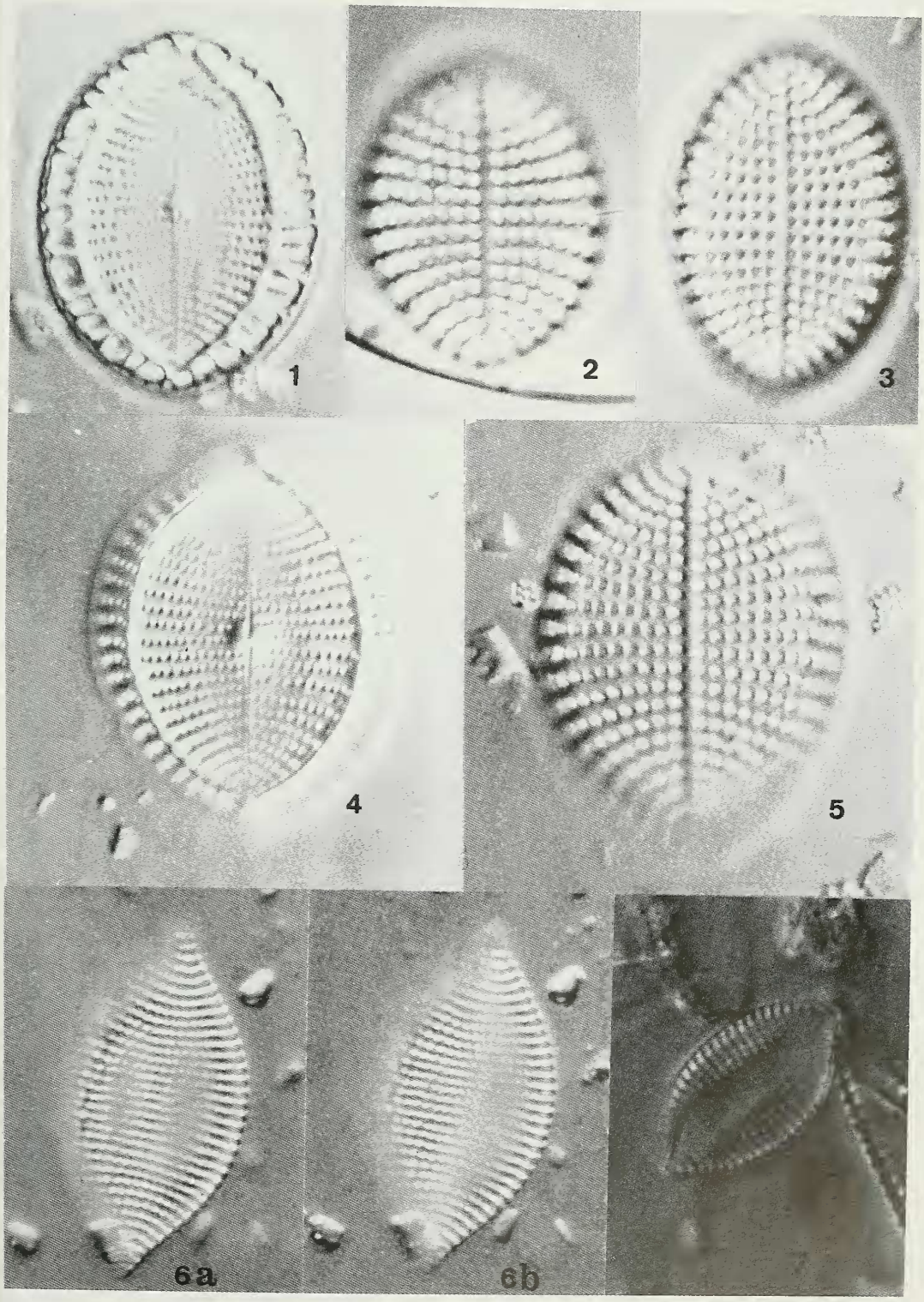
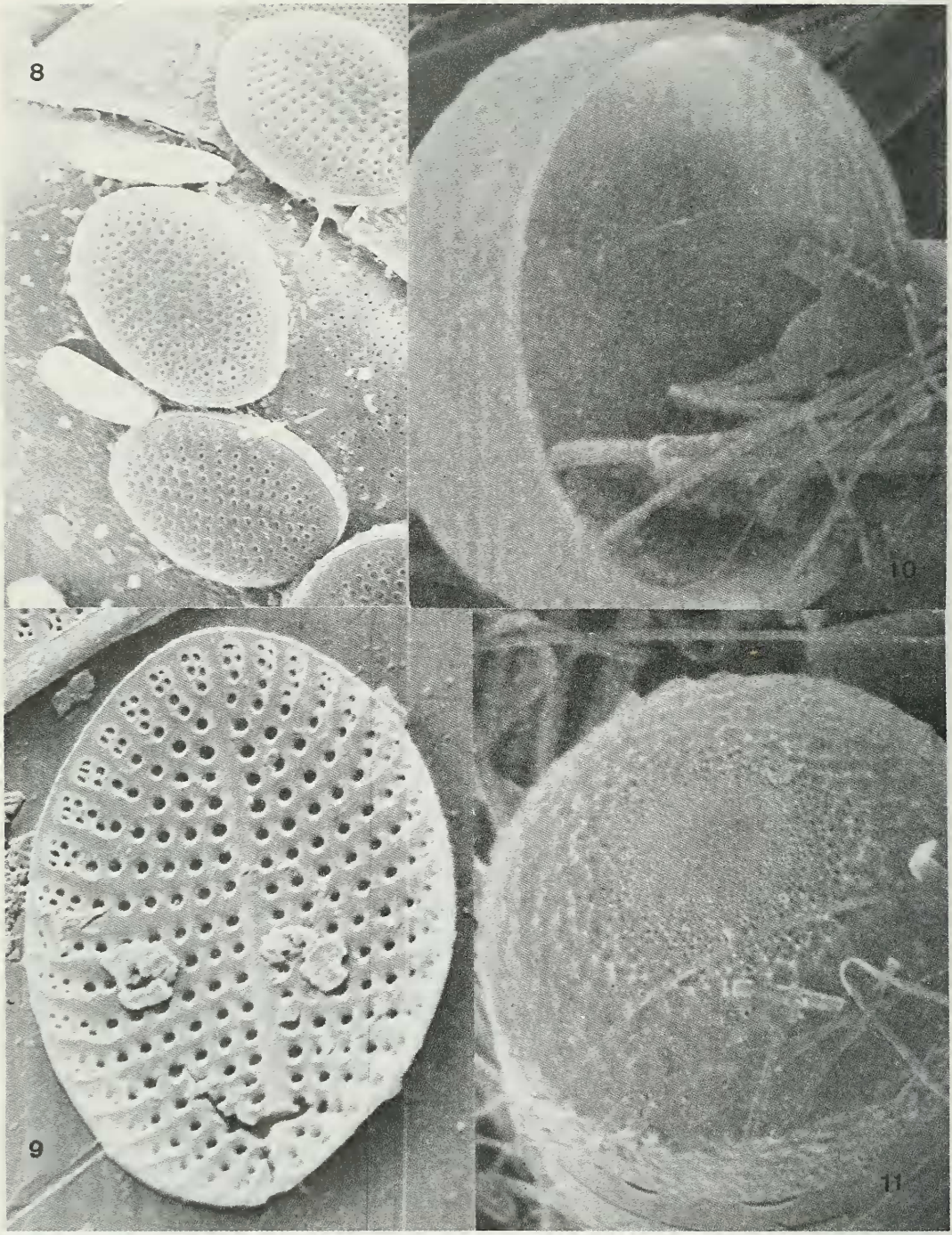
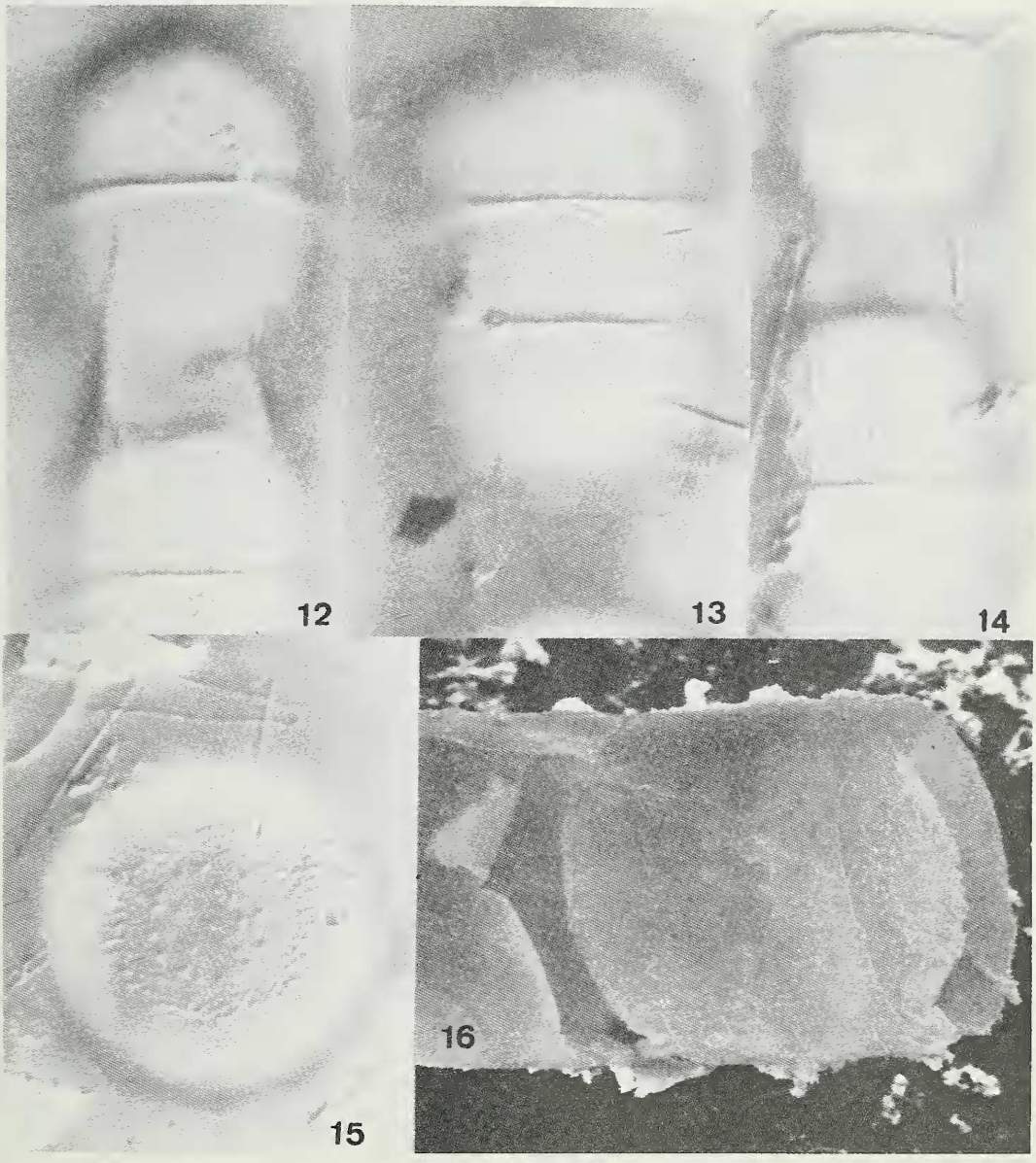


Figs. 1–7: 1,4, *Cocconeis scutellum* raphe valves, 2–3, 5, *Cocconeis scutellum* rapheless valves. 6–7, *Nitzschia hustedtiana*. All figures are X2000.



Figs. 8–11: 8, *Cocconeis scutellum* SEM of rapheless valve, X1600. 9, *Cocconeis scutellum* SEM of rapheless valve, X3700. 10, *Melosira dubia* SEM of inside of valve, X4250. 11, *Melosira dubia* SEM of valve surface, X4200.

punctae subquadrangular, aligned to form 10 longitudinal rows in 10 μm; axial area narrow, linear; raphe valve striae radiate, 10–13 in 10 μm, interrupted near margin by a hyaline ring; punctae round, 16–18 in 10 μm; raphe straight; axial area narrow; central area small,



Figs. 12–16. *Melosira dubia*: 12–14, Light micrographs of girdle views. 15, Light micrograph of valve view. 16, SEM of girdle view. All figures are X2000.

circular. Our specimens are small, although within the size range of 12–40 μm wide by 20–60 μm long given by Hustedt (1959) for *Cocconeis scutellum*. The striae are finer than those often reported for this species, and the raphe valve striae are finer than the rapheless valve striae. The fine striae are undoubtedly related to the small size of the valves, a characteristic also observed by Mizuno (1982), who found that striae density on both valves of *Cocconeis scutellum* var. *ornata* Grun. increased with decrease in valve length. His specimens also had finer striae on raphe valves than rapheless valves. *Cocconeis scutellum* occurred as an epiphyte on the green alga *Rhizoclonium* species and on the diatom *Pleurosira laevis* (Ehr.) Compére (= *Biddulphia laevis* Ehr.) in water with salinity approximately 5 0/00. It is a cosmopolitan polyhalobous species that is frequently reported from coastal regions.

Melosira dubia **Kuetzing**, 1844. Figs. 10–16. Cells cylindrical, 13–25 μm in diameter by 14–30 μm in height, attached to one another by mucilage pads to form chains often more than 15 cells long; valves convex, with a flattened apex and distinctive corona, lacking collars; valve surfaces warty, with several evident processes; striae generally not resolved in the light microscope. *Melosira dubia* is similar to *Melosira nummuloides*, *Melosira arctica*, and *Melosira moniliformis*. It differs from the former two especially in the absence of the collar on valve surfaces. It differs from *Melosira moniliformis* in several features, especially by being smaller and having an evident corona.

Nitzschia hustedtiana **Salah** 1952. Figs. 6–7. Valves elliptical to elliptical-lanceolate, with rostrate-apiculate ends, a longitudinal fold and indistinct keel, 6–13 μm wide by 15–24 μm long; striae 16–19 in 10 μm, nearly parallel near midvalve, strongly curved radiate near ends, distinctly punctate; punctae 16–20 in 10 μm. *Nitzschia hustedtiana* is similar to *Nitzschia punctata* (Wm. Smith) Grun., which is commonly reported from coastal areas. It differs by being smaller and having finer striation. In addition, the longitudinal fold and keel may be less distinct.

N. hustedtiana was discussed by Archibald (1983), who incorporated into this taxon other small *Nitzschia punctata*–like diatoms, including *Nitzschia punctata* f. *minores* Hustedt (1937–1938) and *Nitzschia subpunctata* Cholnoky (1960). Archibald also expanded the original size description of *Nitzschia hustedtiana* to 12.5–20.9 μm long by 5.5–8.0 μm wide based on collections from South African rivers. The Great Salt Lake specimens expand the size range of this taxon to 24 μm long and 13 μm wide, which intergrades with the size range of *Nitzschia punctata*. However, the striae density (16–19 in 10 μm) for *Nitzschia hustedtiana* is distinct from the 7–10 in 10 μm striae range typically reported for *Nitzschia punctata*.

A diatom described as *Nitzschia punctata* has been reported from Utah Lake phytoplankton (Rushforth et al. 1981, Rushforth and Squires 1985), bottom sediments (Grimes and Rushforth 1982), cores (Bolland 1974, Javakul and Rushforth 1983), and the stems of dead *Phragmites* plants on the shoreline (Grimes et al. 1980). These diatoms were 7–8 μm broad by 15–26 μm long, with 14–17 punctate striae in 10 μm and about 22 punctae in 10 μm. Utah Lake frustules differed from Great Salt Lake specimens by being linear-elliptical in shape, resembling closely the frustule illustrated by Cholnoky (1960) as *Nitzschia subpunctata*, which is now conspecific with *Nitzschia hustedtiana*. Thus, these Utah Lake specimens seem to be better identified as *Nitzschia hustedtiana* than *Nitzschia punctata*.

Nitzschia hustedtiana was rare in water with salinity approximately 56 0/00.

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